REMARKS

Claims 1-13 are currently pending in the present application, of which claims 4-13 have been withdrawn pursuant to 35 USC 121. Accordingly, claims 1-3 are currently under consideration.

Claims 1-3 have been amended to more distinctly claim the invention. In particular, claims 1 and 2 have been amended to recite that the basic copper carbonate is a powder and heated to a temperature from above 500°C to 800°C. Claim 3 has been amended to recite language that is more consistent with Markush grouping. Support for the amendments can be found throughout the detailed specification as, for example, in Table, on page 11, and the Examples. Accordingly, entry of these amendments are respectfully solicited.

The specification was objected to for containing various typographical errors such as in the Abstract and in certain parts of the specification. Applicant has amended the Abstract and specification to correct these errors. Accordingly, reconsideration and withdrawal of the objection are respectfully solicited.

Claim 3 was rejected under 35 USC 112, second paragraph, as being indefinite because it did not recite traditional Markush language. Applicant has amended claim 3 to recite the traditional Markush language. Accordingly, reconsideration and withdrawal of the rejection are respectfully solicited.

Claim 1 was rejected under 35 USC 102(b) as being anticipated by Bartley and claims 2-3 were rejected under 35 USC 103 as being unpatentable over Bartley in view of Gottfried. The rejection is traversed and it is respectfully submitted that claims 1-3 are patentable within the meaning of 35 USC 102/103.

Bartley describes a copper-containing catalyst as a catalyst that is used in preparing ethylene glycol from lower alkyl oxalate or lower alkyl glycolate by a vapor phase catalytic reaction. In column 7, lines 1 to 64, an example of the catalyst preparing process is described. First, an aqueous copper ammonium carbonate complex medium is brought into contact with a carrier, thereby impregnating the carrier with copper carbonate. Ammonium is used to enhance the solubility of copper carbonate. Next, the carrier is dried at temperatures ranging from about 50°C to about 200°C, and further the carrier is dried at temperatures ranging from about 200°C to about 500°C for calcinations, so that copper carbonate is converted to copper oxide. Thereafter, hydrogen reduction of copper oxide to copper metal is carried out at temperatures ranging from about 100°C to about 300°C.

Therefore, according to Bartley, copper carbonate is deposited while adhering to the carrier, and thereafter, is heated under oxidizing conditions to temperatures ranging from about 200°C to about 500°C to be converted to copper oxide, and further reduced to copper metal.

In contrast, the present invention is a technique of heating basic copper carbonate powder to a temperature from above 500°C to 800°C, thereby producing a copper electroplating material constituted of easily dissolved copper oxide powder. Bartley only describes, in a process of converting copper carbonate adhering to the carrier to metal copper, that copper carbonate is heated in the process to be converted to copper oxide, and does not describe the technique of heating copper carbonate powder to produce copper oxide powder as a product (copper electroplating material).

Moreover, in Bartley, copper carbonate is heated to temperatures ranging from about 200°C to about 500°C, but in the present invention, copper carbonate is heated to a temperature exceeding 500°C. Basic copper carbonate contains negative ions and positive ions according to its raw material, and these ions (for example, Cl ions, Na ions, and so on: page 10, lines 19 to 28 in the original specification), if contained in copper oxide as a product, become impurities at the time of copper plating. Therefore, these ions should be reduced as much a possible. The original specification describes that the heating temperature is preferably as high as possible in order to prevent the inclusion of the aforesaid ions in copper oxide. Specifically, when copper carbonate is heated at temperatures in a lower range, copper carbonate remains in part, so that impurities contained in copper carbonate remain as they are in copper oxide. Long heating, even at temperatures in a lower range, will reduce the residual amount of copper carbonate, but the shorter heating time is more advantageous. In this respect, the heating temperature is preferably higher. Therefore, in the present invention, temperatures at and below 500°C are excluded so that the present invention is made clearly distinguished from the matters described in Bartley. The effects of the present invention remain unchanged even after such amendment of claim 1. Bartley defines the upper limit of the heating temperature of copper carbonate as 500°C as a wide range, but describes in column 7, pages 43 to 46 that the upper limit is preferably 400°C or lower. This description does not motivate the idea of producing a copper plating material by heating copper carbonate to a temperature exceeding 500°C.

Further, the technique of Bartley is a series of techniques of oxidizing copper carbonate adhering to the carrier and producing metal copper by subsequent reduction, as described above. If this process is applied to the production of a copper plating material, the reduction causes copper oxide to contain metal copper, which will become undissolved residue at the time of copper plating and will cause problems such as variation in plating quality.

As described above, the presently claimed subject matter is not suggested by Bartley, and is not easily achievable by the artisan from this cited example. Therefore, 35 USC 102/103 are not to be implicated.

In addition to failing to suggest the heating step of claims 1 and 2, the cited art does not suggest the washing step of claim 2. In the present invention, the step of washing the dissolved copper oxide with water to provide the copper electroplating material is another aspect of claim 2. But Bartley does not teach this step.

On the top paragraph of page 8 of the Office Action, the Examiner argued that washing is well within the skill of the artisan to remove contaminants of a reaction product, but the washing step of the present invention is not apparent. This is because the step of removing impurities included in a reaction product is typically carried for the purpose of removing impurities generated at a reaction step. If the raw material contained impurities, the impurities should also be removed from the raw material. Therefore, if it was known that basic copper carbonate contained impurity ions, the artisan would wash the basic copper carbonate. It was not apparent in the art, however, that impurities contained in the basic copper carbonate can be removed by washing copper oxide that is produced after the basic copper carbonate is heated. For example, even though basic copper carbonate powder itself is usable as a copper electroplating material, impurities such as Cl ions contained in basic copper carbonate cannot be removed even by washing. On the other hand, if basic copper carbonate is converted to copper oxide, impurities can be removed by washing this copper oxide so that a high-quality copper electroplating material can be produced. Therefore, heating basic copper carbonate powder to convert it to copper oxide powder, and washing this copper oxide powder to produce a copper electroplating powder is not apparent in the art and this process offers advantages over simply washing a reaction product. Based upon the foregoing, it is respectfully submitted that the presently claimed subject matter is not taught or suggested by the combined teachings of Bartley and Gottfied. Reconsideration is requested.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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